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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/015,765	12/17/2001	Hiroshi Komatsu	8733.250.21	3771

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EXAMINER

CHOWDHURY, TARIFUR RASHID

ART UNIT PAPER NUMBER

2871

DATE MAILED: 08/14/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/015,765

Applicant(s)

KOMATSU, HIROSHI

Examiner

Tarifur R Chowdhury

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33-66 and 68-71 is/are rejected.
- 7) ☒ Claim(s) 67 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☒ Certified copies of the priority documents have been received in Application No. 09/116,707.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/116,707, filed on 07/17/1998.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 33-47, 64-66 and 68-71 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of Hebiguchi, USPAT 6,091,473.**

5. The AAPA described in the present application and shown in Figs. 1a-1b, discloses an in-plane switching mode liquid crystal display comprising:

- gate (1) and data (2) bus lines on a first substrate (10) defining a pixel region;
- a common bus line (3) parallel to the gate bus line;

- a thin film transistor at a crossing of the gate and data bus lines, the thin film transistor having a gate electrode (5), a gate insulator (12), a semiconductor layer (15), a source electrode (6) and a drain electrode (7);
- data electrode (8) and common electrode (9) parallel to the data bus line in the pixel region;
- a passivation layer (20) over the thin film transistor and the data electrode (8); and
- a first alignment layer (23a) over the common electrode.

The AAPA differs from the claimed invention because it does not explicitly disclose that the common electrode is formed on the passivation layer.

Hebiguchi discloses an in-plane switching mode liquid crystal display wherein the common electrode is formed on the passivation layer (Figs. 4B, 4C). Hebiguchi further discloses that such a structure provides improved numerical aperture (col. 9, lines 56-59).

Hebiguchi is evidence that ordinary workers in the art of liquid crystal would find a reason, suggestion or motivation to form the common electrode above the passivation layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of the AAPA such that the common electrode is formed on the passivation layer so that the numerical aperture is improved, as per the teachings of Hebiguchi.

As to claim 34, the AAPA described in the present application also shows in Fig. 1b that a black mask (28) and a color filter (29) is formed on a second substrate (11) opposite to the first substrate (10).

As to claims 35 and 36, typically a black mask includes one of a Cr and a CrOx metal with a thickness of about 0.1 micro meter and a width of 10 micro meter.

As to claim 37, the AAPA shows in Fig. 1(b) that a second alignment layer (23b) on the color filter layer (29).

As to claim 38, it is common and known to use polyimide as alignment layers in a liquid crystal display.

As to claim 39, the AAPA also shows in fig. 1(b) that a liquid crystal layer (30) is between the first and second substrates.

As to claims 40-42, it is common and known for an active matrix liquid crystal display to have gate, data, common pads, gate and data lines connected to driving circuits.

As to claims 43-46, the use of metal such as Mo/Al double metal layers as the gate together with the gate electrode and the common bus line, using Cr as the metal for the data together with the source and drain electrodes and using ITO as the common electrode are known in the art and thus would have been obvious to avail a proven material.

As to claim 47, connecting a grounding wire to the gate and data bus lines through a electrostatic shielding circuit is common and known in the art and thus would have been obvious to optimize device performance.

As to claims 64, 68, 69 and 71, it is common and known in the art to form a light shielding layer on the passivation layer to prevent light leakage. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of the AAPA when modified by Hebiguchi such that a light shielding layer is formed on the passivation layer so that light leakage is prevented.

As to claims 65, 66 and 70, common and known material used to form light shielding layer and common electrode includes Mo and ITO wherein the typical thickness of the Mo is about 1000 Å.

6. Claims 48-60, 62 and 63 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art (AAPA) in view of Hebiguchi et al., (Hebiguchi), USPAT 6,137,557.

7. The AAPA described in the present application and shown in Figs. 1a-1b, discloses an in-plane switching mode liquid crystal display comprising:

- gate (1) and data (2) bus lines on a first substrate (10) defining a pixel region;
- a common bus line (3) parallel to the gate bus line;
- a thin film transistor at a crossing of the gate and data bus lines, the thin film transistor having a gate electrode (5), a gate insulator (12), a semiconductor layer (15), a source electrode (6) and a drain electrode (7);
- data electrode (8) and common electrode (9) parallel to the data bus line in the pixel region;

- a passivation layer (20) over the thin film transistor and the data electrode (8);
and
- a first alignment layer (23a) over the common electrode.

The AAPA differs from the claimed invention because it does not explicitly disclose that the common electrodes has first and second oblique sides.

Hebiguchi discloses an in-plane switching mode liquid crystal display wherein the common electrode has first and second oblique sides (3A, 3B, 4A). Hebiguchi further discloses that common electrodes having various shapes such as oblique sides attains high responsiveness (col. 9, lines 50-63).

Hebiguchi is evidence that ordinary workers in the art of liquid crystal would find a reason, suggestion or motivation to use common electrodes having first and second oblique sides.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of the AAPA such that the common electrodes includes first and second oblique sides so that high responsiveness is attained, as per the teachings of Hebiguchi.

Accordingly, claims 48 and 62 would have been obvious.

As to claims 49-60, considering Fig. 3A (reproduced below) of Hebiguchi one of ordinary skill in the art would easily realize that the first oblique side is inclined counterclockwise and the second oblique side is inclined clockwise to an X axis direction wherein the angles are between 0 to 90 degrees. As to setting the angles at

desired position is well within the level of ordinary skill in the art and thus would have been obvious to optimize device performance.

As to claim 63, it is common and known that when a common electrode or data electrode overlaps a gate and/or data bus line it creates storage capacitance.

9. Claim 61 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA as applied to claims 48-60, 62 and 63 above and in view of Hebiguchi, USPAT 6,091,473.

10. As to claim 61, the limitation lacking is that the common electrode is formed on the passivation layer.

Hebiguchi discloses an in-plane switching mode liquid crystal display wherein the common electrode is formed on the passivation layer (Figs. 4B, 4C). Hebiguchi further discloses that such a structure provides improved numerical aperture (col. 9, lines 56-59).

Hebiguchi is evidence that ordinary workers in the art of liquid crystal would find a reason, suggestion or motivation to form the common electrode above the passivation layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the display device of the AAPA such that the common electrode is formed on the passivation layer so that the numerical aperture is improved, as per the teachings of Hebiguchi.

Allowable Subject Matter

11. Claim 67 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

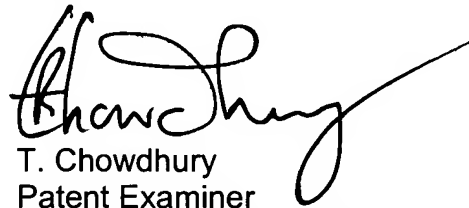
12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tarifur R Chowdhury whose telephone number is (703) 308-4115. The examiner can normally be reached on M-Th (6:30-5:00) Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William L Sikes can be reached on (703) 305-4842. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-7005 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

August 12, 2002


T. Chowdhury
Patent Examiner
Technology Center 2800